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THE GROWING EDUCATION DEFICIT
Corrosion of Our National Security Underpinnings

BY

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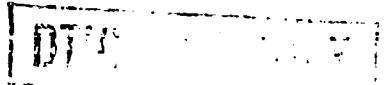
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THE GROWING EDUCATION DEFICIT
Corrosion of Our National Security Underpinnings



AN INDIVIDUAL STUDY PROJECT

by

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TABLE OF CONTENTS

Abstract	III
List of Illustrations	IV
Chapter 1: Introduction	1
Chapter 2: The Role of Education	6
Chapter 3: Recent Trends	11
Trends in Population	12
Trends in Technology	15
Trends in Education	16
Chapter 4: Future Issues	23
National Competitiveness	24
Military Effectiveness	29
Chapter 5: Implications for the Army	33
Army Force Structure	33
Army Technology	35
Army Force Quality	39
Army Recruiting	46
Army Training	49
Army Resources	52
Chapter 6: Conclusions	54
Appendix A: Army Imperatives and Vectors	A-1
Appendix B: National Education Goals	B-1
Endnotes	
Bibliography	

ABSTRACT

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Over the last several decades the quality of American education in elementary and secondary schools (K-12) has been declining, and is documented in several studies and publications. American students are lacking in the fundamental reading, mathematics, language, science, geography and foreign language skills. At the same time that the skills and capabilities are declining, the requirements for higher skilled workers in the public and private sectors is increasing. This increase is, in large part, due to the application of new technologies in nearly every sector of society. The difference between where the U.S. is in terms of cognitive skills, compared to where it needs to be, is what the author terms the "education deficit."

The author reviews the trends in education in relation to national security issues of national competitiveness and military effectiveness; and he discusses some implications for the Army. The conclusion is that the education deficit is corroding the essential elements of our national security and that education reform will be one of the most pressing national security issues for the United States in the decade of the 1990's.

LIST OF ILLUSTRATIONS

FIGURES

Figure 1.	Education Transition Model.....	7
Figure 2.	The Education Deficit.....	30
Figure 3.	AFQT Scores by Occupational Group.....	43

TABLES

Table 1.	Scholastic Aptitude Test Scores.....	21
Table 2.	Aptitude Area Score Changes.....	37

THE GROWING EDUCATION DEFICIT

Corrosion of Our National Security Underpinnings

CHAPTER ONE

INTRODUCTION

There is a crisis in America which is slowly eroding American capabilities, competitiveness and strength. This erosion has serious implications and is, therefore, a source of concern for the future security of our Nation. The crisis is the growing education deficit---the difference from where we are compared to where we need to be in terms of cognitive skills.

America is not "learning up" to either its potential or to its needs. A commercial, which is frequently aired on television, uses the phrase: "...a mind is a terrible thing to waste!" The statement is true, but America is wasting an untold number of minds through its mediocre educational processes. America is wasting the intellectual potential of its youth by failing to develop the basic skills required of the nation.

The United States is spending billions of dollars each year on education processes in primary and secondary schools. However, students are not getting a good education and tax payers are not

receiving a return on their investment. We can, and must do better.

The National Commission on Excellence in Education assessed the quality of American education as follows:

Our Nation is at risk. Our once unchallenged preeminence in commerce, industry, science and technological innovation is being overtaken by competitors throughout the world. This report is concerned with only one of the many causes and dimensions of the problem, but it is the one that undergirds American prosperity, security, and civility. We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people.⁽¹⁾

Recent assessments of educational achievement indicate

that not much has changed since that report was published. In fact, the last eight years have seen continued decline in many areas. The Commission's opening statement is true today: the Nation remains at risk! What are the indicators of the continuing risk? They are highlighted in the *Budget of the United States Government for Fiscal Year 1992*.⁽²⁾

- a. The Scholastic Aptitude Test (SAT) scores of college bound seniors in 1990 remain a full 50 points below the scores of college bound seniors 20 years ago.**
- b. Too many American students read only at the surface level, getting the gist of material without developing an understanding.**
- c. Students do not communicate effectively in writing; and they do not grasp the four basic arithmetic operations in elementary and junior high school.**
- d. American students lack the specialized knowledge needed to address science-based problems and they do not understand the content or significance of events that have shaped American history.**
- e. In grade 5, U.S. students score roughly in the middle on**

international science tests. By grade 9, they score at the bottom of international tests on science and math.

What does this dismal educational performance mean to the nation? The national security of the United States is dependent upon the policies and strategies used to employ the elements of national power (military, political, social and economic) in protecting the nation's interests. The strength of the nation is measured, in large part, by the vitality and effectiveness of the elements of national power, and by how well they are kept in balance over time.

This paper is focused on one of the foundational underpinnings of national power and security: Education. The approach will be to highlight the decline of the American educational system and draw some implications for the Army. The purpose is to focus attention on the close partnership which education has with the military service in meeting national security objectives, and the need for rapid education reform.

The Army can and should play a role in a nation-wide effort to improve the educational systems. It can do so with a two-pronged purpose. First, it is in the Army's interest to

increase the number of quality individuals entering society after high school. This will increase the social and economic strength of the nation and thereby contribute to national strength and stability.

Second, education reform is in the Army's direct interest since it will serve to increase the quality of the target population from which new recruits will come. The Army needs better qualified enlistees in the future to meet its qualitative manpower requirements. Improved quality intake will reduce the amount of time and money which the Army must now devote to training entry soldiers in basic skills after enlistment. The result will be improved training effectiveness in military skills and better use of resources as the Army is forced to operate within smaller budgets.

The American people, must understand the role played by education as an underpinning of our national security. Education is not something that should operate on the margin of society, for it is central to a nation's security. The military must also recognize its relationship with American education as one of a partnership in national security, and not merely the building through which the recruiting pool transits.

CHAPTER TWO

THE ROLE OF EDUCATION

The purpose of education is two-fold. First, to develop people who are capable of meeting the needs of society, and who are capable of earning a living through their productivity and contribution to the economy. And second, to prepare individuals for their responsibilities as citizens by developing the insight and wisdom necessary for an informed electorate in a democracy. We are falling short in both endeavors.

The American educational system (actually there are many systems because education is decentralized to the states and local districts) is producing functional illiterates in the fundamental disciplines of math, science and the English language---not to mention the arts and humanities.

The Education Transition Model (Figure 1) serves to frame a broad discussion. The model is intended to be used as a discussion tool and not as a definitive description of society.

While the model is divided into three separate partitions for ease of description, it is recognized that society is not neatly divided in the same manner. For example, the fact that the home

and church are not drawn within the bounds of the "productive society" does not mean they do not contribute or are not productive. Indeed, they are essential.

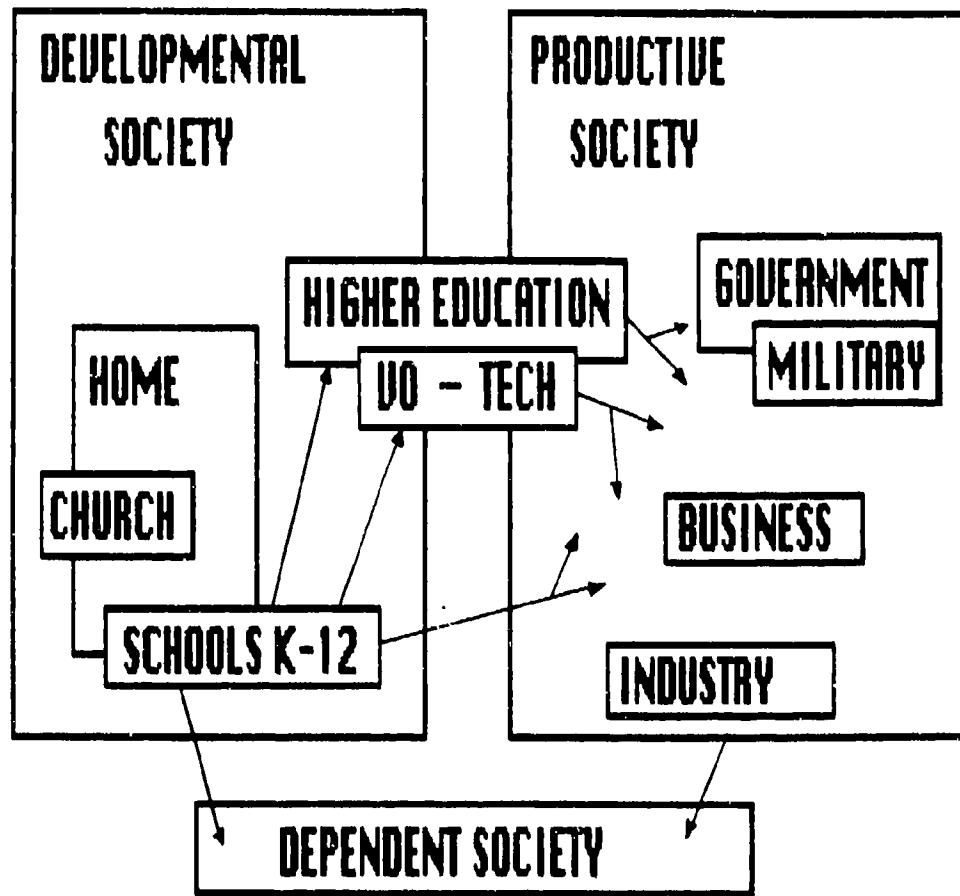


Figure 1. EDUCATION TRANSITION MODEL

The home and church elements, along with the schools, are separated from the "productive society" to emphasize their

primary role in the development of individuals and families. From the "developmental society" come the people who make up the productive element.

Similarly, such arbitrary divisions do not imply that an individual or group exists in only one element. Clearly, an individual or group may exist in more than one element at a time. Likewise, some individuals or groups may transit through some or all elements at various times, while others may never experience all three.

As young adults leave school they generally depart the "developmental society" and enter the "productive society" by obtaining employment (including military service). This employment may be in any part of the productive element: industry, business or government. For the purpose of this paper the military service is dramatized as a subset of government.

Some high school graduates will go on to post-secondary education. This higher education block is depicted as bridging the "developmental" and "productive societies" because of the nature of vocational, college and university activities. After higher education, most individuals will enter the "productive society."

Unfortunately, some individuals will leave school and become part of the "dependent society" which, for all intents and purposes, is unproductive and non-contributive. Some may leave the "productive society" and become unproductive through unemployment actions beyond their control, as a result of individual decisions, or because of personal crises. An example of another type entry into "unproductive society" is the high school drop-out who is unwilling or unable to get a job.

Those in the dependent, unproductive portion of society not only do not contribute, but they require diversion of resources (e.g., social welfare payments) from other societal investments. The high school drop-out category also carries a second-order effect for society in that there is a high correlation of drop-outs to other social ills. For example, two-thirds of all prison inmates failed to complete high school.⁽³⁾

People migrate into and through various parts of this model. From the military viewpoint, some people are recruited immediately following high school, others from higher education and a few directly from other elements of the "productive society" (e.g., business and industry). Likewise, the military turns

out better trained and more educated individuals to higher education, business, industry and other parts of government. Unfortunately, a few will end up in the unproductive element following a period in the productive part.

The best case scenario is for the size of the "productive society" to grow and expand at a reasonable rate; for the "developmental society" to provide the quality citizen to meet the growing needs of "productive society;" and, for the "unproductive society" to shrink. This state would produce a healthy nation of supportive systems.

Ideally, a quality education is the gateway for people to enter the productive element of society. It is this underpinning of the nation's community that determines its economic competitiveness, industrial strength and military power. When the educational system flounders, national security is weakened; when it fails, national survival is at stake.

CHAPTER THREE

RECENT TRENDS

A great deal of media coverage and discussions over the last year have focused on the changes in the world. The most notable discussions are the fall of the Berlin Wall and the crisis in the Persian Gulf. Americans tend to view the changing world with great interest and concern, while ignoring the changes occurring in the United States.

Although less dramatic, and lacking the sensational newsworthiness of world events, there are several recent trends in America which warrant attention. The changes in population growth patterns, the development and proliferation of high technology, and the pending economic troubles must be recognized.

It is these changes---in content and magnitude---which must be addressed if the United States is to remain strong and competitive; and if the United States is to interact with other nations from a position of power and prestige. Education is the critical element in influencing the end-state of these changes.

Trends in Population

Over the last several decades, the United States has witnessed, and has actually been blessed by, significant population growth. This sustained growth has contributed to our leadership role in the industrial revolutions and has made national productivity possible.

In addition to growth, the United States has undergone significant changes in how and where Americans live. During the last three decades there has been increasing urbanization as people left the rural, primarily agricultural-based economy, and moved to the towns and cities where industrial, consumer and service economies prevailed. This migration was made possible, in part, by advances in technologies which made farming more efficient and less labor-intensive. Parallel advances in industrial technology lead to industrial growth and the need for more employees---hence, the draw to the urban centers.

However, the period of the 1990's holds new dynamics. The future size and location of the population will remain important factors, but of equal importance will be "how" the population will live.

In general, the population will be older as a result of what has been called "the graying of America." The number of Americans aged 85 and older will grow at a rate up to four times faster than the general population.⁽⁴⁾

This change in population causes several issues to surface. The aging process will place great demands on the nation's social support structures. Health care providers, programs and facilities will be challenged to provide services to a larger population for a longer period of time. Long-term care facilities (e.g., nursing homes), Social Security, and insurance programs, among others, will receive unprecedented demands. All of these will have a significant impact on the overall economic vitality of the nation.

The population growth rate will be only 0.7% per year by the year 2000, and during this same time the workforce will be growing by 1% annually.⁽⁵⁾ As business and industry restructure their personnel policies to meet this demand, it may require people to work longer and postpone the age at which they retire if they want to receive full benefits.

At the same time, the size of the primary workforce entry population, the high school graduate, is declining. In 1979 the

18-year old male population group totaled 2,171,000 (up from 1,323,000 in 1960); but it declined to an estimated 1,895,000 by 1989.⁽⁶⁾ This represents almost a 13% decline in numbers of 18-year-olds in just one decade. The decline will continue in the next several years.

Growth in most jobs is expected during the decade although the rate of growth may be less. As the entry population declines fewer people are entering the front-end of the workforce to meet the demand for the new jobs. This is compounded by the need to replace those workers departing the back-end of the labor market due to retirements in the next decade.

What does this do in broad terms? The workforce shrinkage, and especially the quality workforce shrinkage (explained later), will create new emphasis on recruiting. Fewer skilled applicants for entry-level positions will make recruiting one of the most important challenges of corporate America.⁽⁷⁾ However, intensified recruiting will not only be required of corporations and businesses in the economic sector, but by public and government agencies as well (e.g., colleges, universities and the military services).

The effect is that more entities, both public and private, are going to be competing for fewer human resources. Specifically, the achievement-oriented, high quality entry-level worker will be in great demand.

Trends in Technology

While we have experienced change in population demographics, perhaps the greatest change in America over the past few decades has been in technology. Kenneth Keller framed it properly when he said, "extraordinarily rapid growth in scientific knowledge in the latter part of the twentieth century, coupled with technological innovation and expansion, is having a profound influence on our lives." He went on to say, "...scientific and technological development can have a profound effect on the values, institutions and patterns of decision-making of the society as a whole."⁽⁸⁾

This growth in technology is changing the very nature of work, and along with that comes the changing nature of job requirements. Even the most elementary jobs will require greater cognitive skills than in the past.

Perhaps more important than any single technology is the cumulative effects of various technologies. As Keller indicated, science and technology influence every aspect of our lives, and the convergence of several technologies requires that we rethink some of the ways we have done business in the past. Long-held concepts and methodologies must be reviewed in light of the dynamic changes which are forecast for America. Antiquated thought and out-dated methodologies must be eliminated.

Unfortunately, these changes and their associated increase in skill demand comes at a time when the educational system in America has been declining. The compound effect of these two dynamics creates a deficit which has serious implications for national security.

Trends in Education

No single element of America is in greater need of rethinking than is the manner in which we educate our children. America needs to address the type of training methods and the adequacy of academic institutions. Technological superiority calls for it, the development of individual potential warrants it, the nation's

economic competitiveness demands it, and our military effectiveness relies on it.

There have been recent indications of increased interest and awareness of the need for educational reform across America. Without intending to degrade those efforts, they must be considered too little, too late. America remains deficient in fundamental skills.

In nearly every area of elementary and secondary education, significant weaknesses and major shortcomings exist. While there are isolated areas (certain schools, certain subjects, certain individuals) which can be used to refute the general findings, these must be considered merely small islands of excellence. Concentration on these successes may help to focus attention and encourage similar reforms, but they must not seduce our thinking and cause us to reach the false assumption that progress is being made and that all is well. It is not!

The reading and writing skills of students have not improved in the 1980's. In January 1990, former Secretary of Education, Lauro F. Cavazos, said "there has been very little educational progress made in the United States....the reading and writing skills

of American students remain dreadfully inadequate."⁹ Some examples:

a. In 1986 there were 700,000 young people who were permitted to graduate from high school, yet they were unable to read their diplomas.¹⁰ Granting social certification, through a High School Diploma, to functionally illiterate citizens renders a disservice to the individuals and to the nation.

b. One study found that one-fifth (20%) of young working people read below the eighth grade level. Not "at" the eighth grade level but "below" that level. And that, as Lee Iacocca says, is almost like being unable to read at all since most of the manuals, instructions and communications in the workplace are written for the ninth through twelfth grade level.¹¹

In similar manner, serious deficiencies are found in geography knowledge and world awareness. These assessments are not made on the basis of specific, technical geographic data or knowledge. According to a recent survey, one in seven adults can not identify the United States on an unmarked map; and one in four adults can not locate the Pacific Ocean.¹²

In the same report which surveyed adult geography knowledge in ten countries, U.S. adults ranked in the bottom third (only Italy and Mexico scored lower); but of more significance to schools and to the purpose of this paper is that those U.S. adults aged 18-24 (the primary age group of entry-level workers and military accessions) came in last.

Likewise, the National Assessment of Educational Progress found a basic inability to identify countries, oceans and states. But a more telling (damning) examination of the crisis in our educational system is that those students who had taken geography courses in high school did not perform any better than those who had not taken geography courses.⁽¹³⁾ The American educational process made no difference!

Some would argue that geography is not that important. However, it is difficult to believe that in a shrinking world ("the global village") that a basic knowledge and understanding of the world would not matter. On the contrary, it seems that there is an absolute need for some minimum level of geographic competence. In our international interdependence and growing trans-national associations, we can no longer neglect geographic

relationships and the broader cultural issues of our world which are associated with geography and its diligent study. Unfortunately, only nine states require even one geography course before students graduate from high school.⁽¹⁴⁾

Associated with the geographic weakness is the inability of most Americans to communicate at a basic conversational level in a foreign language. However, as desirable as that is, at this stage of the educational crisis communicating in a foreign language must be considered an extra luxury. But it is a necessary consideration for the future. The current focus must be on the absolute need to get American students to effectively communicate in the English language, both orally and in writing.

In a more objective assessment of educational competence, the Scholastic Aptitude Test (SAT) results indicate that the general ability of the American high school student is declining. The following table records the decrease.

The 10.3% decline in the total scores from 1970 to 1988 is dramatic. If there is any good news in the data, it is that the rate of decline is less from 1980 to 1988 (4.5%) than it was from 1970 to 1980 (6.1%).

SCHOLASTIC APTITUDE TEST SCORES (AVERAGE)⁽¹⁵⁾

	1970	1975	1980	1985	1988
VERBAL	460	434	424	431	428
MATH	488	472	466	475	422
TOTAL	948	906	890	906	850

Table 1. SCHOLASTIC APTITUDE TEST SCORES

There is considerable consternation over the SAT and whether or not it is relevant anymore. For a variety of reasons, the SAT was designed to test general ability and not specific achievement. Because of that, critics of the SAT argue that what a student learns in class does not matter; and because so much depends on the scores (as discussed below) schools tend to just teach the test. There are even specific courses in most schools designed for SAT preparation, some during school and others after school. There are also commercial educators and training firms which teach SAT preparation courses for a fee.

As unattractive as those two points may sound, it is alarming

when the results are reviewed. If, in fact, the schools and commercial firms are specifically teaching to the test, then why are the scores declining? Does that speak more to the status of education and the ability to teach and learn than the scores themselves?

While not ignoring the weaknesses of the SAT and the need for change in the entire evaluation and assessment systems, the relevance of the SAT is related to its use. It remains the centerpiece of our educational system. High schools are measured by their students' scores; colleges and universities use the scores in their admissions processes; scholarships are often based on the scores; and institutions of higher education are, themselves, ranked by the average scores of the freshman class.

However, this must all be kept in perspective. The real issue is that the SAT results are declining and they reflect lower abilities on the part of those students taking the test. The trend can be viewed in two ways. First, as the measurement of the effectiveness of the educational system; and second, as one of the base measurements of the population from which employment intake (including many military) will come.

CHAPTER FOUR

FUTURE ISSUES

The future is unclear at best. Change is occurring in great magnitude and with such surprising speed that it is difficult to keep up---let alone to anticipate change and its effects. But whatever the future holds, the principal elements of our national security policy and strategy will remain valid.

Education is the bedrock. It is the base upon which the nation is built, and it is the source of our national strength. The shortfall in education will have far-reaching consequences in several areas. However, two major areas which impact on national security are: economic competitiveness and military effectiveness. The manner in which these develop will, to a great degree, determine the nature of the political-diplomatic element of power.

To the extent that our national competitiveness and military effectiveness are weakened by the lack of people with requisite qualifications and capabilities, our political, diplomatic and military leaders will be forced to operate from a position of weakness and limited power. The consequences are serious.

National Competitiveness

Historically, one of the keys to America becoming a world power was the strength of its economy. The United States has led the world in industrial output and economic development. America rapidly moved from the period of the industrial revolution, with its heavy industry and labor-intensive character; through the transition to consumer goods and services; and it now stands in the threshold of the era of information and knowledge acquisition and transfer.

This growth contributed to the nation's competitiveness. America's competitiveness was the result of its ability and capacity for large scale production. What made production possible was the application of increasingly higher technologies. All this lead to a vibrant economy capable of sustaining growth. Because of this, the American people have enjoyed one of the higher standards of living in the world.

However, this is changing and the change is dramatic, although it may not yet be fully recognized. Perhaps, because things have been too good, America has been blinded or unwilling to recognize the downturn and to take appropriate action.

Some observers of this phenomenon point out that the change should not have come as a surprise, since it has been taking place for several years and its markers have been visible, e.g., the demise of the U.S. steel industry; the loss of leadership in microchip technology; and the general bankruptcy of the nation's economy---served witness by the growing debt and deficit.

While there are undoubtedly many reasons for the economic competitiveness dilemma now faced by the United States, the crisis in the educational systems is at the heart. American businesses have been disadvantaged by American education since 20% of the entire American work force may be functionally illiterate; and 43% of Americans aged 21-25 are unable to master directions, communicate ideas, or calculate at a level to perform well.⁽¹⁶⁾

Lee Iacocca has said, "a country's competitiveness starts not on the factory floor or in the engineering lab. It starts in the classroom."⁽¹⁷⁾ America's economic survival depends more on education than on technology or better management alone.

For the American economy to remain viable and have healthy growth, American companies must not only compete among

themselves, but also among international corporations and regional entities as well. The only way to achieve this is through a competitive workforce. The only way to achieve a competitive workforce is through the development of educated, competent people who are able to meet the demands of the modern workplace.

The Hudson Institute published a report on their vision of the future workforce and the requirements expected by the year 2000 and into the twenty-first century.⁽¹⁸⁾ That report addresses several important points, including:

- a. The fastest growing jobs will be in the professional, technical and sales fields requiring the highest education and skill levels.
- b. Of the fastest growing job categories, all but one (service occupations) will require more than the median level of education for all jobs.

That same report went on to emphasize that as society develops and becomes more complex, the amount of education and knowledge needed to make a productive contribution to the economy becomes greater. Therefore, between now and the year

2000, the Hudson Institute believes that a majority of all new jobs will require post-secondary education.⁽¹⁹⁾

This makes it clear that the economy of tomorrow will not be able to absorb the semi-educated or semi-literate high school graduates we have today. It will certainly not be able to absorb the high school drop-out. In the past, the robust national economy of high density labor-intensive jobs was able to take low quality, unskilled workers and effectively employ them in some contributing endeavor. This, perhaps, hid the growing educational crisis, or at the very least, may have delayed its recognition as a problem.

The future will not be as tolerant for two reasons. First, unlike the recent past, the population of entry-level workers is declining. Consequently, there will be fewer young people to "throw away" and better use will have to be made of this precious and declining resource. Second, there will not be any place for the non-achievers and drop-outs to go. Technological advances have reduced the number of jobs to which unskilled workers can go and still earn a living.

Can any nation, especially the United States, be

internationally competitive with a workforce which is deficient in the fundamental skills of reading and writing; or which lacks basic reasoning abilities; or which knows very little about their state and nation; or which knows even less about foreign countries and their peoples; or which has almost no foreign language capability? The answer has to be that it is extremely doubtful.

Alvin Toffler perhaps said it best: "Significantly, education is no longer merely a priority for parents, teachers, and a handful of education reformers, but for the advanced sectors of business as well, since its leaders increasingly recognize the connection between education and global competitiveness."⁽²⁰⁾

It is imperative that the United States remain economically competitive. Failure to do so makes the United States vulnerable. Internal deterioration and decline can lead to loss of power and prestige. What some nations were unable to accomplish through military power may be achieved through economic force if the United States loses economic competitiveness.

Economic vulnerability may create increasing demands for a stronger military. The irony in the situation is that one depends upon the other. As education undercuts our economic

competitiveness it also undercuts military power; and the two combined undercut national security.

Military Effectiveness

The same dynamics which have the potential to weaken the economic competitiveness of the United States, and hence its economic power in the world, have the same potential to weaken its military effectiveness. In effect, the educational crisis inflicts a double blow to national strength and security.

To maintain military preparedness, the nation relies heavily upon a strong and healthy economy to adequately fund its military personnel, equipment and facilities. As with most large systems, the two are inextricably linked.

That which was true in 1984 is equally applicable today: the military stands at the edge of a new age, when the strength of its forces and effectiveness of its weapons are increasingly influenced by the education and aptitudes of its personnel.⁽²¹⁾ The educational crisis directly impacts on the quality of personnel entering and staying in the military.

Figure 2 dramatizes the effects of the imbalance between

supply and demand for quality personnel. On the left side is the "demand." These cognitive skill requirements are, in general, created by the application of various technologies throughout the military. Military jobs require increasing skills and mental capabilities. On the right side is the "supply," which represents the quality of personnel available to meet the skill demands.

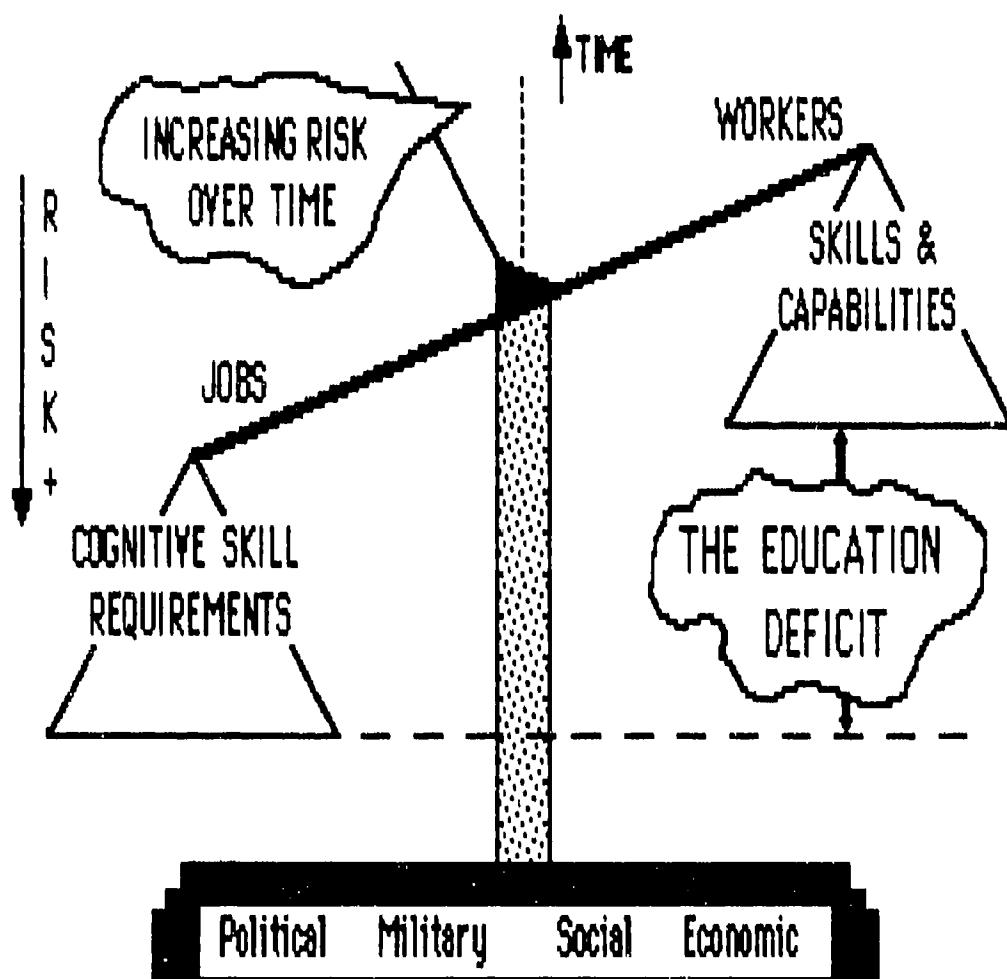


Figure 2. THE EDUCATION DEFICIT

The difference between what is required of the job and the ability of entry-level workers (enlistees) to meet these requirements represents the educational deficit. The challenge is to reduce this deficit by producing adequate numbers of individuals who possess sufficient quality to meet the skill requirements (balance the scale). Reducing the requirements is no longer an option.

Other influencing forces on this dilemma are the numbers of jobs and the numbers of graduates (entry-level workers). They are depicted as the two arms of the cross beam. The pivot point may not always be in the center of the cross beam whereby the number of jobs and the number of graduates are equal. Demographic reports indicate that in the future we may, in fact, find more jobs than graduates qualified to fill them.

The physics of the situation begins to compound the problem. If the "jobs" arm of the scale increases in length in recognition of the growing number of jobs which requires increased cognitive skills, that arm is extended and the pivot point is no longer in the middle. The heaviest "weight" is extended farther to the left from the fulcrum. That represents an even greater educational

deficit (the requirements are greater and the supply is less able to balance the demand).

The extent to which these two elements are out-of-balance equates to military inefficiency and ineffectiveness. That, in turn, translates into risk (at the top of the scale); and the more the two are out-of-balance, the greater will be the risk.

When the element of time is depicted extending from the top of the scale, the longer the two remain out-of-balance, the greater the risk becomes over time.

Therefore, from the military perspective it is imperative that every effort be made to reduce the educational deficit in the very near future. Aggressive action is needed.

CHAPTER FIVE

IMPLICATIONS FOR THE ARMY

The environment in which the Army operates is dynamic. Budgetary constraints mandate significant changes. But these changes are to be made within the framework of the Army's six imperatives operating along three vectors (Appendix A). The underlying necessity for the future Army (and a fundamental presumption) is an intelligent, educated and capable force.

Army Force Structure

But what kind of force will it be? The specific composition of the future Army is unknown. The Army planners and force integrators are faced with a tremendous challenge to meet budgetary guidance while ensuring a capable force. The only thing certain is that the future force of the Army will be significantly smaller in size than it is today.

Force planners have not yet determined and published the proper mix of units between the Active Component and the Reserve Components. Specifically, what number, type and size of Corps, divisions, engineer brigades, hospitals, transportation

battalions, supply companies, personnel and finance units, etc., remains to be finalized. These decisions are critical to the future Army since they are the first step in determining the specific skills that will be required.

Once the units are determined the internal composition will follow and the type and number of specific Military Occupational Specialties (MOS) can be identified. It is from here that the qualitative needs of the service will be determined. From this information base, the recruiting forecasts and sustainability decisions will be made.

Current planning calls for a smaller yet more lethal force capable of meeting a wide range of potential threats throughout the world. The underlying presumption is that the reduced strength will be compensated for by increased capabilities achieved through the application of a variety of technologies. Recent successes in "Desert Storm" will tend to reinforce the value of high technology in the future force---especially in a smaller force.

A smaller force will also require greater empowerment of the individual soldier and leader to execute tasks and missions

with greater autonomy and less supervision. This requires individuals who can think, reason, and arrive at logical conclusions. These cognitive requirements will grow and place even greater demands for quality people.

Fortunately, there is every indication that the Army leadership is proceeding with due diligence and prudence to avoid reckless force cuts. One of the overriding considerations during the upcoming "build down" of the Army is the preservation of its quality personnel. The Army can ill-afford to release soldiers who possess needed skills (quantity); and, from within that group, to release those who have the capability to support the future force requirements (quality).

Army Technology

Technological advancements over the last decades have changed the face of the modern military; and, concurrently, the military's need for educated, high-aptitude personnel has grown dramatically.⁽²²⁾ The complexity of technical weapon systems requires increased abilities.

The future of the smaller, more lethal force is based on the

acquisition and implementation of even more high technology applications. Nearly every new major system in the Army is effected by technology, including: smart weapons, fiber optics, electro-thermal propulsion devices, robotics, directed energy, deep attack weapon systems, communications management, and command and control systems.

In the Communication-Electronic field alone, the Army introduced over 249,000 major items of equipment between FY 83 and FY 89.⁽²³⁾ Each of these placed increased demands for higher skilled personnel to operate the systems and maintain the equipment. As greater reliance is placed on these, and other technologies, the demand for higher quality soldiers increases.

Clearly, the increased technological applications are creating an increased demand for greater numbers of the higher skilled individuals. As a total Army, when comparing the inventory to the changes in quality requirements from FY 83 to FY 90 for category I-III A, a shortage approaching 40 per cent was projected.⁽²⁴⁾

The effects of authorization increases in selected MOS by aptitude area score requirements (Table 2) serves to highlight the increasing need for more highly qualified personnel.

APTITUDE AREA SCORES	AUTHORIZATIONS		CHANGE +/-	CHANGE %
	FY 83	FY 90		
120 +	672	876	+ 224	33
115 - 119	na	na		
110 - 114	343	762	+ 419	122
105 - 109	1,049	1,364	+ 315	30
100 - 104	8,643	10,150	+ 1,507	17
95 - 99	8,961	10,551	+ 1,590	18
90 - 94	na	na		
85 - 89	47,346	41,163	- 6,183	13

Table 2. APTITUDE AREA SCORE CHANGES⁽²⁵⁾

There are some observers who, with good reason, express concern that new weapons, communication systems, vehicles and other equipment are becoming too complicated and demanding for military personnel to operate effectively.⁽²⁶⁾ Others point out that while technology may make today's systems simpler to

operate, their high technology make them a maintenance and logistical challenge which requires better educated technicians and more intense and expensive training.⁽²⁷⁾

While a fourth-grade education was sufficient during WWII,⁽²⁸⁾ it is not today. Because of this, it can be argued that while a high school education is sufficient today it will not be in the future, unless the real value of that education increases dramatically. Increasingly, some education beyond high school will be the desired level (e.g., in the form of vocational education, technical training or an associate degree).

To the extent that a large number of the military occupations (e.g., administration, medical, transportation, data processing, inventory and parts management, engineering, communications, maintenance) are reflective of their civilian counterparts, it may be instructive to look to the civilian projections.

The Hudson Institute reports that of the fastest growing job categories, all but one (service occupations) require more than the median level of education for all jobs. And when jobs are given numerical ratings according to the math, language, and reasoning skills they require, only 27% of all new jobs fall into the lowest

two skill categories, while 40% of the current jobs require these limited skills.⁽²⁹⁾

In like manner, the basic requirements of the infantryman and armor crewman will increase as well, although perhaps not to the same degree. The nature of their weapon systems and associated tasks will require more cognitive skill than earlier generations.

Army Force Quality

The Army needs more than just men and women to fill its ranks. It needs, and will increasingly need, men and women of quality to meet specific needs. The Deputy Chief of Staff for Personnel has said that quality accessions will remain the foundation upon which a quality Army is built.⁽³⁰⁾

The Army enjoys a relatively high quality of soldier. The service has justifiably taken great pride in the nature of its personnel. There is no doubt that when compared to enlistees of previous years, today's forces are the best we have had. However, that does not address the issue of what is needed.

Quality is a relative concept and may be a function as seen

"in the eye of the beholder." It is important not to take false comfort in rhetoric, misunderstood data, or marketing slogans. Two historical personnel issues serve to make this point.

First, commanders in World War II complained that they were getting poor quality soldiers because too many were coming from the lowest mental category. Consequently, Department of the Army arbitrarily decreed that the top half of that lowest mental category would be considered to have come from the next higher mental category. Enlisted soldiers were identified accordingly and the complaints from the field stopped. The fact of actual soldier quality did not change---it was the same as before; but now the perception was different. The only change was an arbitrary, administrative personnel designation.⁽³¹⁾

A second example was during the late 1970's and early 1980's when the Army was proclaiming the success of the All-Volunteer Force (AVF). These proclamations were emphasizing the high quality soldiers who were enlisting as evidence that the AVF was working. Commanders in the field were in general agreement. Yet, the Army later acknowledged that from 1976 to 1980 the Armed Forces Qualification Test (AFQT) had been

misnominated allowing many applicants in the below-average mental category to enlist.⁽³²⁾

In a related revelation, the Department of Defense acknowledged in a 1985 report to Congress that the ASVAB (Armed Services Vocational Aptitude Battery) calibration problems held serious consequences for the Army, by stating: "From 1978 to 1980, nearly half of all Army enlistees fell into the lowest quality categories allowed to enlist, and only one-fourth occupied the categories normally viewed as high quality. The quality of Army recruits fell to an all-time low during this period, even lower than the period of heavy mobilization for World War II."⁽³³⁾

These are two examples of when quality was more a perception than a condition which could be accurately measured and statistically supported. Several dynamics may have been at play, not the least of which was the self-fulfilling prophecy. The point is that when one speaks of quality the term needs to be defined and understood.

One of the measures of "quality" used today is the Armed Forces Qualification Test (AFQT) scores of new enlistees. It is from these scores that the mental categories associated with

enlistment standards are determined. However, the test results are designed to be indicative of how ready an individual is to profit from military training. They are not a measurement of inherent mental capacity or achievement.⁽³⁴⁾

Figure 3 shows that the average AFQT percentile score of every occupational group in the Army (except Occupation Code 9) was lower in 1984 than in 1975. Over this ten year period the AFQT mean score in the principal occupations dropped an average of 2.1 per cent.

While not representing mental capability, these figures indicate that the enlistees in 1984 were less prepared to profit from military training than their predecessors in 1975. So, reliance upon mental category descriptors derived from the AFQT as a measurement of quality has limited utility. When talking about personnel quality, it is important to know the terminology and the measurement factors.

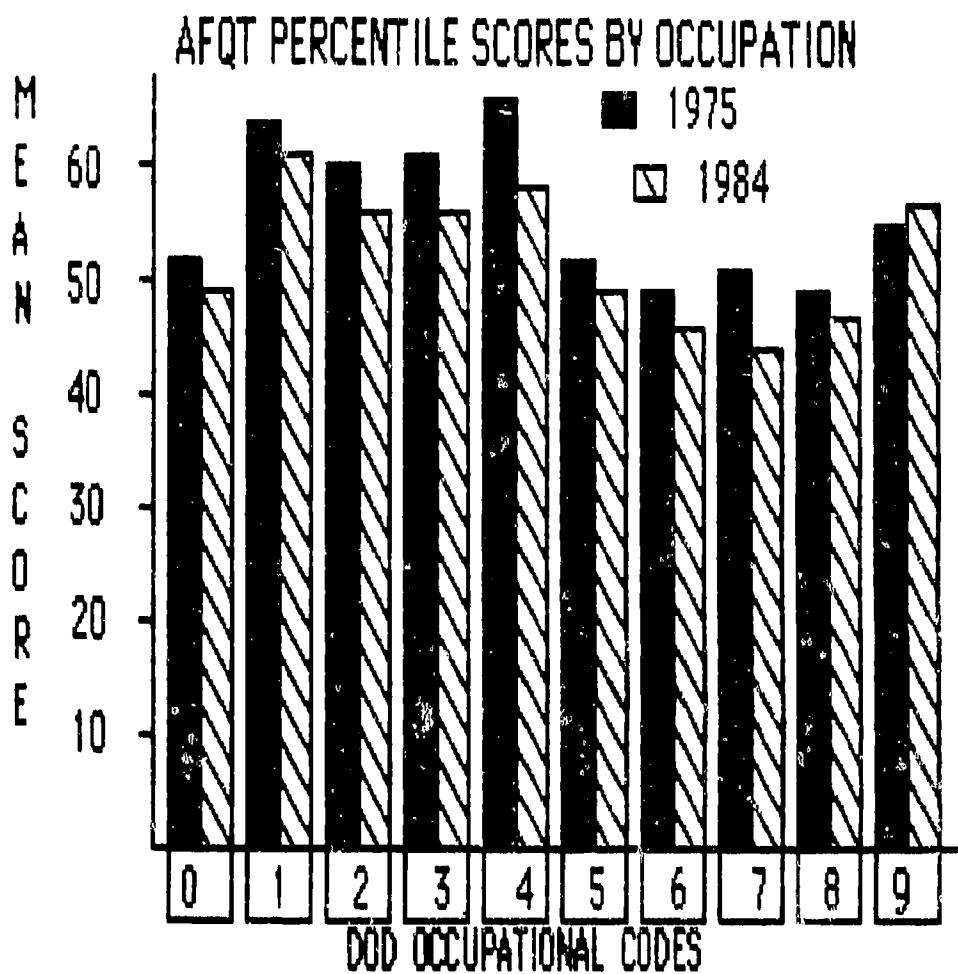


Figure 3. AFQT SCORES BY OCCUPATIONAL CODE⁽³⁵⁾

Explanatory Note: DOD Occupational Code Titles are:

- 0 - Infantry, Gun Crews, and Seamanlike Specialists
- 1 - Electronic Equipment Repairers
- 2 - Communications and Intelligence Specialists
- 3 - Medical and Dental Specialists
- 4 - Other Technical and Allied Specialists
- 5 - Functional Support and Administration
- 6 - Electrical/Mechanical Equipment Repairers
- 7 - Craftsmen
- 8 - Service and Supply Handlers
- 9 - Nonoccupational (trainees, patients, prisoners, etc., and those in undesignated occupations)

The other prime indicator of quality has, over many years, been defined in terms of the number of high school diploma graduates enlisted. The U.S. Army Recruiting Command has done a tremendous job in raising the number of enlistments of High School Diploma Graduates (HSDG) over the last decade. In 1980, only 54% of the enlistees had a high school diploma, whereas 97% of Army recruits enlisted so far in Fiscal Year 91 (October 1990 to March 1991) had a diploma.⁽³⁵⁾ That increase has benefited the Army in several ways and should not be overlooked.

There is, however, a body of information that indicates a high school diploma is less meaningful today than in the past. Those who hold the diploma are, generally, less qualified in math, science and language than graduates in previous years.

Increasingly, the true meaning of a diploma is more a record of attendance than of capability. So while the Army may continue to enlist the same number or percentage of High School diploma graduates, in reality the actual quality of personnel (in terms of capability and achievement) may actually be declining.

It is sometimes difficult to measure what is really important, so there is the tendency to believe that what is measured is what

is important. The Army must guard against the tendency to believe that what is measured (the high school diploma) is what is really important.

It would be more important and critical to the selection process to measure or assess demonstrated capabilities. Neither the high school diploma nor the Armed Forces Qualification Test (AFQT) scores do this. What is needed is a comprehensive national assessment of skills and capabilities---a knowledge and performance assessment given nationally to students. The Armed Services could use the results of this instrument to better determine the quality of an individual in terms of his or her capability. It is gratifying to note that efforts by the National Education Goals Panel include this specific issue.

There would be benefits from this approach in other areas, including the education system itself. It would serve to assess how close students are to where they should be in terms of national standards derived from a goal-focused curriculum.

Those who advocate that we "maintain" today's quality; or those who put it in terms of personnel actions which will ensure that the force of the future "...is as qualified as it is today," are

treading water. The military requirements of the future force will demand a "better" qualified soldier than we have today. But, the quality must be defined in terms of capability, specific skills, and cognitive thought processes; not in attendance or aptitude, alone.

Army Recruiting

The U.S. Army Recruiting Command has been doing an excellent job in attracting and enlisting new soldiers from those available. However, their ability to attract sufficient numbers of recruits of true quality is inhibited by the fact that the schools are not producing sufficient numbers of individuals who are capable of meeting the basic cognitive skills of the military and the nation.

Great emphasis is placed on the number of recruits with High School diplomas as one of the measurements of quality. As indicated earlier in this paper, given the degradation of our educational institutions the diploma may be nothing more than a certificate of endurance; or as some refer to it as a certificate of approximate age and "seat time."

There is a recognized correlation between high school graduation and the likelihood that the individual will stick with

the Army long enough to complete an enlistment.⁽³⁷⁾ So the diploma may be valuable in predicting attrition. It is increasingly doubtful that it can be considered a measurement of quality, and certainly not of mental capability or skill proficiency.

Historically, the enlistment criteria (e.g., test scores and education) have fluctuated as a function of the number of recruits available compared to the numbers needed. When there has been an abundance of young people in the primary recruiting target population group and the requirements comparatively few, the standards have tended to increase. Under those conditions the service could afford to be more selective. The opposite holds true when the **availables** are few and the need is great.

The Army, however, is facing a recruiting environment in which the quantitative requirements will decline while the qualitative requirements increase (Table 2). Both of these dynamics are occurring at a time when the target population of enlistment age is declining.

Consequently, there may be a need to reassess the selection and classification methods in addition to the standards used in our recruiting and entrance programs. Because of the changes in skill

requirements, educational output and population projections, it is important to ensure that the selection process remains credible. Some researchers suggest that the current systems may be outdated, imprecise and simplistic artifacts of simpler times.⁽³⁸⁾

Part of the military services advertising budget should address the need for education and learning before the student graduates. The military services should take joint action (e.g., common commercial advertising) to encourage students to stay in school. It is presently done in a passive sense, but more aggressive action should be taken to directly encourage school attendance.

In addition to attendance, Army advertising should encourage and challenge students to achieve a high learning and competency level while they are in school. Perhaps enlistment incentives for mental category I and II individuals who also achieve a certain high level on a national competency assessment instrument or exam would be appropriate.

A new approach in recruiting advertisements (temporarily held in abeyance during "Desert Storm") has been to highlight the skills and abilities that one learns while in the Army and which are

desired by civilian employers. The intent, apparently, is to attract recruits based on higher employment expectations for a better job after military service. This, and many other enlistment advertising campaigns, appeal to the basic "economic man" concept and can be very effective.

The military does provide excellent training and leadership opportunities. It also permits the development of life-long skills which are desirable in any employment situation. But the basis for these skills begins in the school house with a quality education; and a quality education would make the military contribution or enhancement of the individual that much easier.

The approach to combine employer desires and military needs has merit. It further supports the need for concentrated efforts to encourage students to stay in school and to achieve some measure of academic excellence. Reducing the disgraceful drop-out rate, itself, will be a significant achievement.

Army Training

The Army enlists some of the best young Americans who are available and who desire to participate in military service,

recognizing that most of the high aptitude individuals will go on to college or other endeavors rather than enlist in the Army. However, each year over 100,000 soldiers are enrolled in the Army's Basic Skills Education Program.⁽³⁹⁾ This training is designed to overcome the educational shortfall in the basic, fundamental skills. Soldiers do not learn military skills in this program. Rather, it is oriented on reading, writing, spelling and arithmetic; skills which should have been learned in twelve years of school.

Even though training of these skills after enlistment should not be required, the Army considers it an obligation to develop these individuals and so it provides the training. It is in the Army's interest to do so, since soldiers who do not possess these fundamental skills are of minimal value and their potential is severely limited.

Unfortunately, this type of in-house training is not peculiar to just the military. Large corporations are also finding it necessary to engage in similar training for their employees. Three out of four U.S. Corporations are forced to train new employees in basic reading, writing, and arithmetic at a cost of \$25 billion a year.⁽⁴⁰⁾

If the nation's schools were turning out high school graduates who were true quality---capable of minimum performance in today's society---there would be no need for this training by either industry or the military. The fact that BSEP is necessary is indicative of the limited value of a high school diploma as a measure of quality in terms of capability.

If all entry-level soldiers possessed the necessary cognitive skills to effectively read and write the English language, and if they entered with the necessary mathematical skills, the Army could spend its training time and resources in other areas. It would be more acceptable and understandable if the military, rather than having to teach fundamental skills, was training and enhancing basic geographical and foreign language capabilities. Teaching of these skills in the context of military applications would be beneficial. But again, learning geography and foreign languages should begin in the elementary and secondary schools.

As the technical requirements of military specialties increase and the costs of operating/firing/flying advanced systems increases, so will the reliance upon computer simulation for training. The simulation method is effective and efficient, but it

will likewise call for greater cognitive skills to comprehend, communicate and apply the training to the military task.

If Army training is to be efficient and effective it must begin with soldiers who possess fundamental skills and have a common base of capabilities which permits them to benefit from the training. This is not the responsibility of the military service; rather, it is the responsibility of the elementary and secondary school systems in America.

Army Resources

BSEP is a costly program in several ways. The dollars spent to teach these basic skills are, in effect, a federal (Department of Defense) subsidy for ineffective public schools---schools which turn out high school graduates who do not have the required basic skills. The Army must train or retrain these soldiers in order to have the quality soldiers it needs.

Soldiers in BSEP are away from their units during the time they are enrolled, and they do not participate in military training with other members of their squads, section, platoons, etc. This is counter-productive to the efforts made to mold cohesive,

effective units. The lost opportunities to the larger unit are also costs to be associated with BSEP training, although they may not be quantified in dollar terms.

Likewise, costs associated with the lack of education are not always direct costs. The problems and inefficiencies in the workplace as a result of soldiers who cannot do simple math problems; or who cannot read, follow or write simple instructions; or who cannot articulate simple ideas in a clear, coherent narrative sentence, are all hidden costs associated with the educational deficit. They contribute to errors and inefficiencies on the job.

But, it is important to understand that high quality recruits will cost money. The old adage of "getting what you pay for" holds true. These costs will be in support to local recruiters, advertising, and appropriately targeted incentive packages, etc. While these costs may be high, a comprehensive cost-benefit analysis may indicate that it is less expensive in the long run than is the alternative ("pay me now, or pay me later").

CHAPTER SIX

CONCLUSIONS

Our national security interests involve more than just foreign and defense policy issues. They also involve domestic policies and actions. Specifically, our national security interests demand educational reform in the very near future. If America is to regain its position of world leadership, reform cannot wait any longer. The educational crisis is corroding the underpinnings of the economic, social, political and military elements of national power.

William B. Johnston provides a capsule description of the need: If the U.S. is to reassert itself to world leadership, the educational standards that have been established in the nation's schools must be raised dramatically. Students must go to school longer, study more and pass more difficult tests covering more advanced subject matter. From an economic standpoint, higher standards in the schools are the equivalent of international competitiveness.⁽⁴¹⁾

The nation is in need of fundamental, perhaps drastic, educational reform. Since the publication of the assessment "The

Nation at Risk" in 1983, there has been very few accomplishments which provide meaningful structural and procedural change.

But, things are not all bad. Through several local initiatives, some reforms have taken place and progress is on the horizon. The Educational Testing Service (ETS) reports that during the 1980's, 42 states have raised high school graduation requirements; 47 states have installed statewide student testing programs; and 40% of high schools have instituted longer school days providing more learning exposure time.⁽⁴²⁾

However, as Gregory Anrig, ETS President, has said, "we're pulling out of it [the academic nose-dive], but we're still flying at a low altitude."⁽⁴³⁾

What will it take to provide the energy to continue down the road of academic reform? The answer is undoubtedly to be found in national leadership. President Bush has taken the first steps to provide the leadership, along with the Nation's State Governors, by establishing six National Education Goals (Appendix B). The National Education Goals Panel, Chaired by Governor Roy Romer of Colorado, is aggressively acting on the ways and means to realize these goals.

We now have the goals, something on which to focus our efforts. With committed leadership and defined goals, America can get on with the business of meeting the challenge; much as was done in the early days of the U.S. space program when the Soviet Union launched the satellite "Sputnik."

Sputnik surprised the United States and it felt directly threatened by the Soviet Union. America was challenged into action. America made excellence in science and math education a national priority. This led to scientific and technological advances which benefited the country and the world. America rose to meet the challenge and quickly reestablished itself as the world leader.

In a similar manner, the United States needs to recognize the threat to our national security and way of life which is posed by the growing educational deficit. It is equally threatening. Hopefully, once it is fully recognized, it will have the same effect on today's citizens as Sputnik did years ago. The nation must rise to meet the challenge and fundamentally revitalize its educational approach.

The education crisis, like others (e.g., Chrysler Corp., Lockheed Corp., and the current Savings and Loan Crisis), will take

a national effort. If money and managerial overwatch are available to "bail out" businesses and institutions when they decline or go bankrupt, it seems that the same resources, concern and involvement (if not more) should be made available for the national education system in its time of crisis.

It is clear that as America undertakes the necessary reforms to reverse the education decline, adequate funding will be essential and that more money will be required. However, more money alone will not necessarily yield better education. The United States already spends more money per student (over \$4,000 each) on education than nearly every other country on earth. From 1970 to 1989, while per-pupil spending steadily increased by approximately \$1,700, the achievement levels in reading, science and math scores did not improve.⁽⁴⁴⁾ The key to effective education reform will be to determine how best to invest available dollars to realize the greatest return.

Emphasis in education must change from input (e.g., money and facilities) to output (i.e., quality students capable of making a contribution). Teachers, educators, parents and students need to think less in terms of "teaching" and more in terms of "learning."

Schools must become accountable for their products and not just their processes.

It will take investment capital of time, sweat and other resources at all levels. To produce more, we need to invest more---in teachers, students, strategies, methodologies and materials; but most importantly in parental and civic involvement. While much blame is placed on the desks of teachers and school administrators, "they" are not the total problem. "We" (society as a whole) have abandoned the teachers and students, choosing to place our time, money and energies elsewhere. An indicator of this abandonment is that 75% of all parents never visit their children's school.⁽⁴⁵⁾ That is, three out of four parents never "visit" their school and therefore they may not know where it is located, what their child's classroom looks like, or who is teaching what---let alone get involved. It is time that America "recapitalizes" its investment in education.

There are no quick fixes or easy solutions to reducing the education deficit. Those who think otherwise do not understand either the present or the desired state of education competency. America cannot afford not to make the hard decisions. As Derek

Bok of Harvard, has said, "If you think education is expensive, try ignorance."⁽⁴⁶⁾

In the final analysis, it comes down to what America wants. While the comment below speaks directly to military services, it is equally applicable to business, industry, and to the society as a whole:

The question is...can the services recruit and retain sufficient people with the right skills to meet their needs? The answer to that requires more than economic equations or the counting of high school diplomas. It rests on the commitment of a nation, of a people, to do whatever is necessary to preserve their freedom and way of life.⁽⁴⁷⁾

The decline in American educational achievement is alarming and its effect is corroding the underpinnings upon which our national security is built. Education reform will be one of the most pressing and important national security issues of the United States in the decade of the 1990's.

APPENDIX A

ARMY IMPERATIVES

Quality Force

Realistic Doctrine

Appropriate Force Mix

Tough, Realistic Training

Continued Modernization

Competent, Confident Leaders

ARMY VECTORS 1991

"Desert Storm"

Worldwide Readiness

Shaping The Future Army

Source: HQDA Briefing Charts

APPENDIX B

NATIONAL EDUCATION GOALS

1. By the year 2000, all children in America will start school ready to learn.
2. By the year 2000, the high school graduation rate will increase to at least 90 percent.
3. By the year 2000, American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter, including English, mathematics, science, history and geography, and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.
4. By the year 2000, U.S. students will be first in the world in science and mathematics.
5. By the year 2000, every adult American will be literate and possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.
6. By the year 2000, every school in America will be free of drugs and violence and offer a disciplined environment conducive to learning.

Source: Office of Management and Budget, Budget of the United States Government - Fiscal Year 1992, Part 2, p. 8.

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